

Methodology for Implementing the Environmental Protection Expenditure Account (EPEA) for Italy

Metodologia per l'implementazione del conto satellite delle spese per la protezione dell'ambiente (EPEA) per l'Italia

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Riassunto: Il conto satellite EPEA costituisce uno standard internazionale, coerente con i sistemi di contabilità nazionale SNA93 e SEC95. Attraverso diverse tavole contabili vengono analizzati vari aspetti quali domanda e offerta di servizi di protezione dell'ambiente, flussi di finanziamento volontari e coatti intercorrenti tra i vari settori dell'economia, etc. In coerenza con le linee guida operative predisposte da Eurostat, l'Istat costruisce il conto partendo dall'analisi dell'offerta dei servizi di protezione dell'ambiente e procedendo, con opportuni metodi ed informazioni, a successive disaggregazioni per tipo di domanda (consumo intermedio, finale, formazione di capitale), di utilizzatore (imprese, famiglie, PA) e per soggetto finanziatore della spesa.

Keywords: environmental protection, EPEA, SERIEE, wastewater, waste, NACE 90.

1. Introduction to the EPEA

The main objective of the EPEA (Environmental Protection Expenditure Account) is to provide an aggregate indicator of the total economic resources that a country uses for protecting the environment. This indicator, consistently constructed and complete, is presented showing its evolution over time and its key components, i.e. environmental domains (air, waste, wastewater, etc.), sectors of the economy (government, enterprises, households) and types of expenditure (current and capital expenditure). The economic resources devoted to environmental protection (EP) are most easily measured in the form of EP services which are produced by units of the domestic economy and then used by resident units. Such EP services are e.g. waste and wastewater management services produced by specialist public and private units and purchased by households and firms, but they also include in-house measures undertaken by producers in order to reduce the negative impact of their activity on the environment, as well as non-market activities of government and non-profit institutions for EP. All actions and activities that are aimed at the prevention, reduction and elimination of pollution as well as any other degradation of the environment are included⁽¹⁾. EP includes all measures aiming at protecting the environment under a *qualitative* perspective; activities and actions that

⁽¹⁾ Actions and activities which serve other goals while having a favourable impact on the environment do not come under EP (e.g. activities which primarily satisfy technical needs or the internal requirements for hygiene or security of an enterprise or other institution).

aim at protecting the environment under a *quantitative* perspective, e.g. at managing and saving the stock of natural resources, are excluded⁽²⁾. EP is broken down into several domains (environmental media or type of pollution-nuisance-degradation): air and climate; wastewater; waste; soil, groundwater and surface water; noise and vibration; biodiversity and landscape; radiation. In addition to these, R&D, administration and management and education, training and information activities are included, to the extent that they are carried out in connection to one or more of the listed domains.

The EPEA is based on the main national accounting concepts and is a satellite account, designed to describe in a way consistent with national accounts the transactions related to EP and to allow links with physical data. It applies the principles, rules and classifications of national accounts, as well as the valuation concepts and the definitions of transactions and aggregates, thus ensuring consistency and completeness and avoiding double counting. The EPEA aggregates, therefore, can be put in relation to corresponding aggregates of national accounts. The accounting framework includes a set of five interrelated tables which describe: the supply of EP services and the way they are produced (Table B); the EP national expenditure, i.e. the expenditure for the consumption of EP services, for gross capital formation (investment) and some other transactions connected with EP like e.g. the use of “cleaner” products (Table A); a table integrating supply and uses of EP services (Table B1); the financing of EP expenditure (Table C); the net cost burden of EP for the various sectors of the economy (Table C1).

2. Scope of the first Italian application and main data sources

The Italian EPEA covers, so far, the wastewater and waste management domains, which together represent at the European level around 70% of the whole EP expenditure. On the supply side the application covers mainly specialised producers (i.e. EP is their main activity) belonging to the General Government (GG) and enterprise sectors, classified under division 90 (2-digits) of the European classification of economic activities (NACE). The relevant national sub-categories (5-digits) of the NACE90 division are the following: 90.00.1 Collection and treatment of waste; 90.00.2 Wastewater management and treatment. In practice the Local Government units (LG) that provide wastewater and waste management services (i.e. municipalities) and private enterprises specialised in the production of the same kind of EP services are included. Ancillary producers of EP services belonging to the enterprise sector are covered as well (i.e. producers that undertake EP activities in-house for own use in order to limit the negative environmental effects of their main production activity). The use side of the analysis encompasses the uses of the EP services covered on the supply side, i.e.: all possible uses of market output of waste and wastewater EP services (final consumption of households and intermediate consumption of enterprises and GG units other than EP

⁽²⁾ Activities like water supply or the saving of energy or raw materials are regarded as the management of natural resources and are excluded from the EPEA. These measures are included in the Resource Use and Management Expenditure Account (RUMEA), which is part, together with the EPEA, of the European system of satellite accounts on the environment (SERIEE). Such activities, nevertheless, are included in the EPEA to the extent that they mainly aim at environmental protection; an important example is recycling which is included to the extent that it constitutes a substitute for waste management.

producers), as well as the collective consumption in the case of non-market output of EP services⁽³⁾; no example of capital formation, however, has been found so far.

The main data sources include: national accounts for the supply and use of EP services produced by specialised producers, a specific survey on ancillary EP services produced by enterprises and other financial statistics and accounts (e.g. for the analysis of government outlays for EP).

3. Main characteristics of the Italian methodology and some results

The EPEA compilation starts with the analysis of the output of EP services and of the investments (Table B), since this information is most reliable and widely available. The EP services produced are presented by type of output (market, non-market and ancillary) and for the main categories of EP producers: specialised (broken down into GG and enterprises) and non-specialised producers (see Figure 1). This supply is then complemented with information on the uses in the integrated supply-use table (Table B1), where the output at basic prices coming from Table B is revaluated at purchasers' prices⁽⁴⁾ and broken down by kind of uses (final consumption, capital formation, intermediate consumption). These uses are further broken down by user, based on data on amounts paid for EP services (market prices, taxes, other charges, etc.). Then the national expenditure for EP services can be determined (Table A). This aggregate is finally analysed by financier unit (Tables C and C1): usually, the users finance their purchases themselves; deviations from this principle are mostly due to GG transfers (e.g. investment grants for EP activities, subsidies) or to taxes earmarked for EP.

The most part of the basic data used for the Italian EPEA concerns the supply and uses of EP services produced by specialised producers classified under the NACE90 division. The starting point is the Production and Generation of Income Account (PGIA), which is regularly produced at basic prices for each institutional sector (GG market producers, GG non-market producers, enterprises) with reference to the NACE90 division as a whole (2-digits); i.e. the three national sub-categories of the NACE90 (5-digits) – 90.00.1 Collection and treatment of waste, 90.00.2 Wastewater management and treatment, 90.00.3 Sanitation and similar activities – are not singled out. The basic approach is therefore to break down by national sub-category the PGIA of the NACE90 division, in order to estimate the output and the production costs of the GG and enterprise units classified under the three different national sub-categories: the results obtained for the categories 90.00.1 and 90.00.2 enter the production account (Table B); the results obtained for the 90.00.3 category are excluded.

Two different methods are followed. For the corporation sector the PGIA is broken down proportionally to the distribution by national sub-category of the value added of enterprises⁽⁵⁾. For the GG sector first the output at purchasers' prices of waste and wastewater EP services is estimated on the basis of data on purchases of EP services (i.e. waste and wastewater taxes and charges); data on VAT of the NACE90 division derived from the Input-Output Table are then used in order to calculate the output at

⁽³⁾ According to the European System of national Accounts (ESA95), an output is called *market* if it is sold at a price which covers at least 50% of the production costs and *non-market* if not.

⁽⁴⁾ By adding taxes on EP services (mainly non-deductible VAT) and subtracting subsidies on these services, as well as by adding imports and subtracting export (rarely important for EP services).

⁽⁵⁾ This is estimated by means of data provided by the annual survey on enterprise economic accounts.

basic prices; then the PGIA is broken down proportionally to the value of the output estimated for each sub-category. The figures obtained with these processes are further used for breaking down other aggregates of specialised producers like e.g. investments.

Figure 1: *Selected EPEA figures for the waste domain, Italy, 1997 (millions euro)*

EP production at basic prices by EP producer					EP uses at purchasers' prices by kind of use			
EP output, sales, investments	Specialised producers		Ancillary producers	Total	final consumption	capital formation	intermediate consumption	Total
	General Government	Enterprises						
Output of EP services	3.335,8	4.789,6	124,6	8.250,0				
market	2.204,5	4.789,6	-	6.994,1	3.292,9	-	4.384,0	7.676,9
non market	-	-	-	-	-	-	-	-
ancillary	-	-	124,6	124,6	-	-	124,6	124,6
Sales	2.204,5	4.789,6	-	6.994,1				
Investments	88,7	2.915,3	63,8	3.067,8				

EP uses at purchasers' prices by user							
Uses	Final consumers		EP Producers		Other producers	Total	
	Households	General Government	Specialised producers				
			GG	Enterp.			
Uses of EP sold output (market, non market)	3.292,9	-	-	-	4.384,0	7.676,9	
Uses of EP ancillary output	-	-	-	-	124,6	124,6	
Investments for EP services	-	-	88,66	2.915,3	63,8	3.067,8	
National EP expenditure by user	3.292,9	-	88,7	2.915,3	4.572,4	10.869,3	

EP uses at purchases' prices by financier							
Financers							
General Government	109,8	-	88,7	-	13,5	212,0	
Corporations	-	-	-	2.915,3	4.558,9	7.474,2	
specialised producers	-	-	-	2.915,3	-	2.915,3	
other producers	-	-	-	-	4.558,9	4.558,9	
Households	3.183,1	-	-	-	-	3.183,1	
National EP expenditure by user	3.292,9	-	88,7	2.915,3	4.572,4	10.869,3	
National EP expenditure auto-financed by user	3.183,1	-	88,7	2.915,3	4.558,9	10.746,0	

The output and the investments of the ancillary EP services produced by enterprises for own use are quantified on the basis of data collected through an ad hoc questionnaire in the context of the annual survey on enterprise economic accounts.

With the aim of improving the accuracy and timeliness of the account, the methodology is currently under revision. For example, as a possible alternative a method is being set up for estimating the EP output and production costs through a bottom-up approach, i.e. starting from micro data provided by GG finance statistics or surveys on economic accounts of enterprises.

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